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Inglis, Robyn Helen orcid.org/0000-0001-6533-6646, Sinclair, Anthony, Shuttleworth, Andrew et al. (1 more author) (2013) Preliminary Report on 2013 Fieldwork in Southwest Saudi Arabia by the DISPERSE Project : (2) Jizan and Asir Provinces, February-March 2013. Report. Saudi Commission for Tourism and Antiquities

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**PRELIMINARY REPORT ON 2013 FIELDWORK IN SOUTHWEST
SAUDI ARABIA BY THE DISPERSE PROJECT : (2) JIZAN AND ASIR
PROVINCES
FEBRUARY–MARCH 2013**

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Introduction

Archaeological and geomorphological fieldwork was undertaken over four weeks in February and March 2013 in the provinces of Jizan and southern Qunfudah (Figure 1). The primary goals of the work were to: (a) survey for locations with early stone tools in order to expand the number of archaeological sites and the range of artefact material; (b) identify geological deposits and sedimentary sections that might provide palaeoenvironmental and chronological context for the archaeological material. Survey focussed on a selection of areas, chosen because they have previously yielded evidence of early stone artefacts, or because they are areas identified in earlier survey work as having potentially attractive geological, geomorphological and topographic conditions for human occupation and the preservation and visibility of archaeological evidence (Devès et al., 2012; Bailey, Inglis et al., 2012; Devès et al., 2013). In total, over 50 locations were visited and logged using GPS, the majority with Palaeolithic artefacts, over 700 in total, including artefacts typical of Early (ESA), Middle (MSA) and Later Stone Age (LSA) affinities. Preliminary analysis of the collected lithics was conducted prior to their deposition in the Sabya Museum, Jizan Province. Samples for specialist palaeoenvironmental and dating analyses were collected from a number of locations, and were prepared for shipping back to the UK. The following report summarises the observations by area.

Background

Considerable recent new work has focussed on the search for Palaeolithic sites in Saudi Arabia and more widely in the southern Arabian Peninsula, given its key geographical position between Africa and Eurasia, with the expectation that there should be an abundant distribution of early human occupation extending back to very early periods of the Stone Age (Armitage et al. 2011; Petraglia et al. 2011; Rose et al. 2011; Delagnes et al. 2012, 2013; Groucutt & Petraglia 2012). However, the record is still very patchy, chronological control is limited, and large areas still remain to be explored in detail. In the DISPERSE project (Bailey, King et al., 2012) we have focused on the Southwest region of Saudi Arabia, because of its proximity to Africa, the likelihood of relatively easy population movement directly across the southern end of the Red Sea in the vicinity of the Hanish Sill (Lambeck et al., 2011), the probable importance of coastal regions in human dispersal, and the generally favourable environmental conditions for human occupation in the southern Red Sea escarpment and coastal plain throughout the climatic changes of the Pleistocene, including an extensive and now-submerged landscape extending for up to 100 km westward of the present coastline during periods of low sea level.

Our aim in DISPERSE is to undertake new archaeological and geomorphological survey in the region, combined with mapping techniques to reconstruct landscape evolution from the regional to the site scale, and to assess the relationship between Palaeolithic sites and their landscapes and the impact of physical landscape characteristics and environmental factors on the nature and distribution of early human settlement and dispersal. This work includes exploration of the now-submerged landscape, which is reported elsewhere

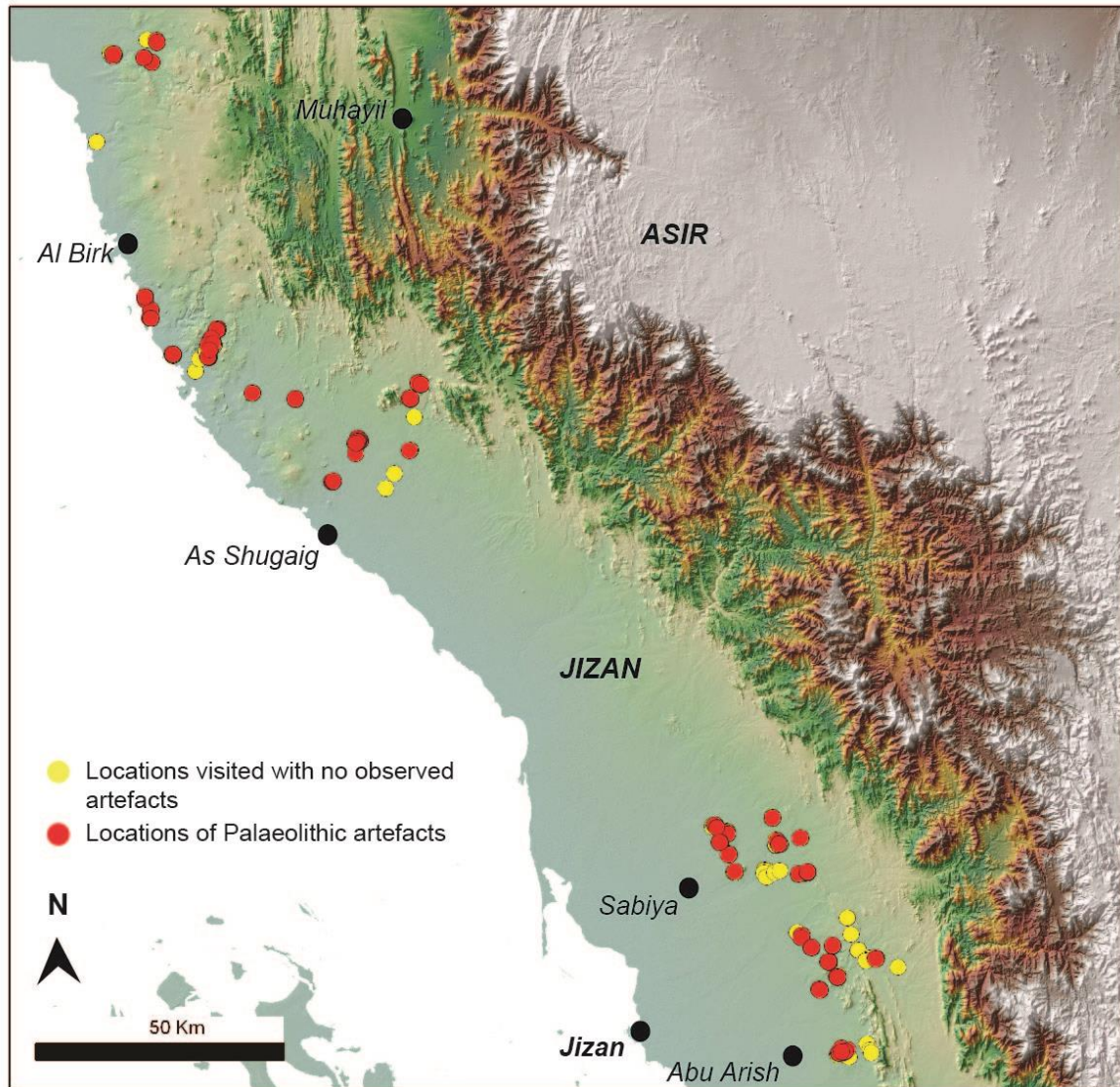


Figure 1. Overview map of locations visited in 2013 showing locations where Palaeolithic artefacts were observed. Elevation data © CGIAR-CSI SRTM 90m v4.1 database. Map prepared by Robyn Inglis.

Methods

Prior to survey, satellite imagery (LandsatGeoCover 2000/ETM+ Mosaics and imagery accessed through Google Earth imagery) and DEMs (ASTER GDM v2 and SRTM 90m v4.1) was used to map and classify landforms, with ground-truthing visits in May–June and November 2012 (Bailey et al. 2012; Devès et al. 2012, 2013; Inglis et al. In Press). Landforms were assessed for their potential for surface Palaeolithic archaeology and preservation of, and access to, potentially artefact-bearing stratigraphy. Survey in February 2013 focused primarily on areas of low sedimentation and high potential for visible surface archaeology, to rapidly assess the region's archaeological potential.

A four-wheel drive vehicle was used to access target areas, with further exploration on foot. Areas targeted included lava flows and exposed bedrock, especially on flat and elevated terrain providing a good view over the surrounding landscape. Previous experience in this region and elsewhere has shown that these vantage points often attract prehistoric people, and artefacts dropped in such locations can remain in place for many millennia without further disturbance or burial by sediment cover.

In the target areas the terrain was slowly traversed on foot by team members spaced at 5–10m intervals walking along transects of 100–500m distance, sometimes further, the distances varying according to local circumstances. Key geomorphological features for dating landscape evolution, such as raised beach terraces and sections in quarries, were also targeted for sampling and dating where appropriate, and accessible sections were scanned for the presence of artefacts visible in situ.

Fifty-four target areas were explored in this way, and Palaeolithic artefacts were recorded at the great majority. Following the practice established in the 2012 surveys, all locations visited and artefacts observed were logged with a hand-held GPS and given a unique Waypoint (WP) number with its own GPS coordinates. Artefacts located in a given target area but further apart than the horizontal margin of error in the recording equipment (typically ± 5 –10m for standard hand-held GPS) were given different WP numbers. In areas with high densities of artefacts, a sampling strategy appropriate to the local conditions was employed. For example, at one Waypoint the number of artefacts was counted within four 5m x 5m squares distributed across a 200m transect, but only a sub-sample of artefacts was removed. In another case, all lithic material within a 2m x 2m square was collected for later examination to determine more accurately what was worked and what was naturally flaked. Photographs were taken of artefacts in situ before removal and of the surrounding terrain.

The WP number is the key identifier attached to all records and labels and allows for the integration of all relevant data including artefact locations, photographs and other descriptive information within a single relational database or GIS. Over 700 lithics were recorded in this way and collected for later cleaning and preliminary analysis prior to deposition in the Sabya Museum in Jizan Province.

Southern Jizan

Wadi Nakhlan and Jebel Akwah

Investigations in the area East of Sabya focussed on the twin cinder cones of Jebel Akwah, and the line of schist and granite jebels that run NW–SE behind the cones, as well as the upper parts of Wadi Sabya and Wadi Nakhlan (Figure 2). Ten locations were visited in this area, and artefacts observed at all locations.

Jebel Akwah

Lava flows at the edges of both of the cinder cones were visited. On the northern cinder cone, a few Palaeolithic artefacts made on local basalt, both of ESA and MSA type, were

observed on the edges of the lava flows (WP485–491 and WP479–484), along with two rounded pebbles that may have been transported onto the lava flow by humans for use as hammerstones (WP470–478). No artefacts were observed on the Western flanks of the Southern cinder cone (WP400–403), and two rounded pebbles were observed on the lava flow above the wadi that runs between the jebels (WP518–520).

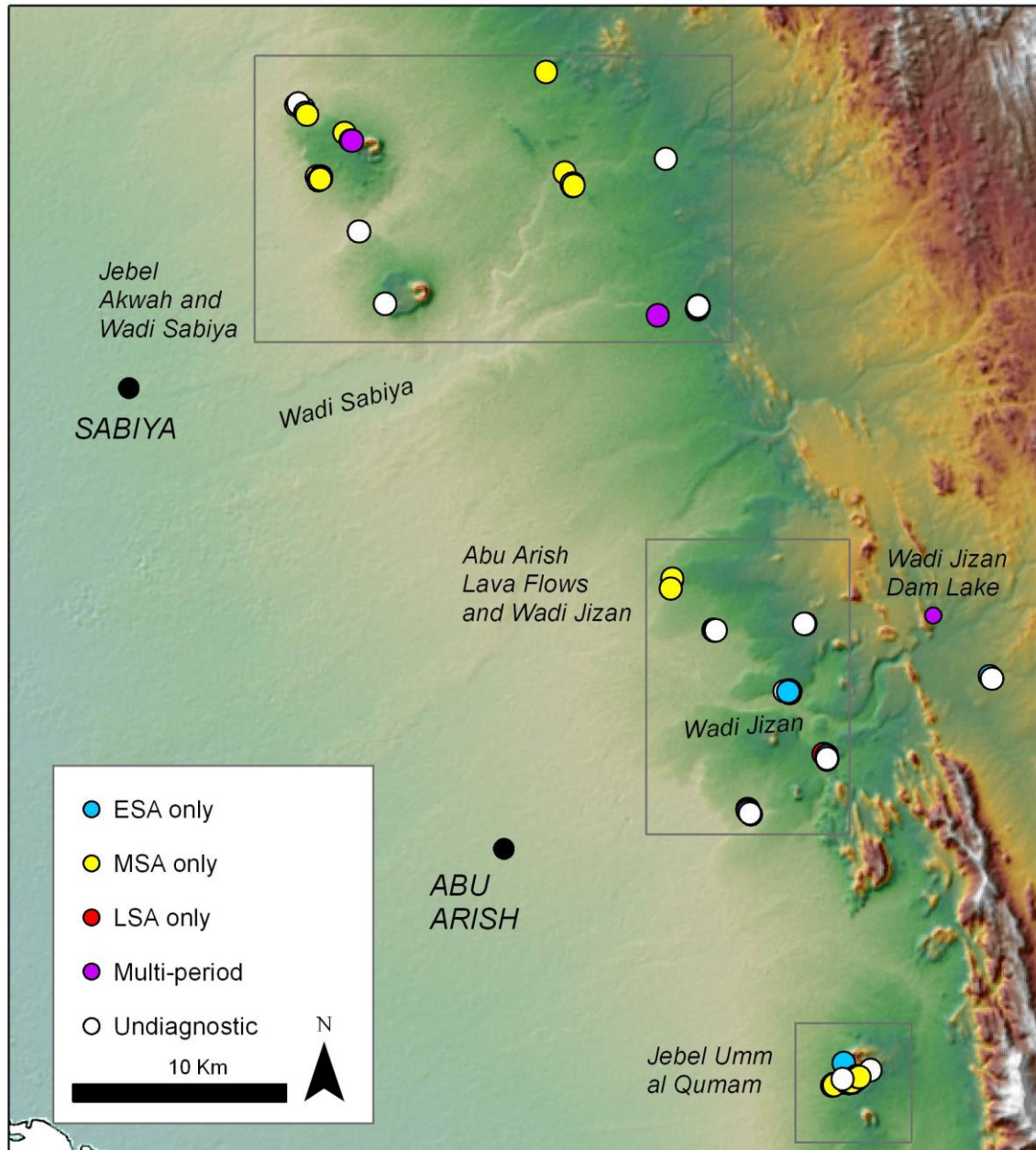


Figure 2. Map of locations visited in Southern Jizan showing interpreted cultural affinities of Palaeolithic artefacts observed. Elevation data © CGIAR-CSI SRTM 90m v4.1 database. Map prepared by Robyn Inglis.

Wadi Sabya

The incision of Wadi Sabya and its tributaries through the sediments lying to the south of the Jebel Akwah cinder cones exposes up to 15m of silts, wadi sands and gravels preserved under volcanic tuff (Figure 3), extending over a number of kilometres (WP513–517, WP521–524). No artefacts were observed in these sections, yet the current (although problematic) date of c. 0.3mya for the deposition of the tuff (Müller 1979) opens the possibility that stratified ESA-age artefacts are preserved in these deposits.



Figure 3. Volcanic tuff overlying silt and sand sediments to the SE of Jebel Akwah - the Southern cinder cone can be seen in the background. Photo: Robyn Inglis

Further upstream of the quarried area, the wadi incises through a basaltic dyke (WP525–6). An andesite flake and discoidal basalt core indicate potential ESA or MSA activity in the area.

Two areas were visited where wadis flow through the line of schist jebels that run parallel to the escarpment and rift:

- At WP529–538, material recovered from the jebel adjacent to the wadi ranged from ESA and MSA material on basalt and chert to potentially later LSA material made on shale.
- At WP498–502, on linear jebels of schist and basalt, quartzite and basalt ESA and MSA artefacts were observed.

Only ceramics and two small undiagnostic flake artefacts were observed on the alluvial terrace to the East of the line of jebels at WP493–497. It thus appears that this alluvium, which overlies the volcanic tuff observed in Wadi Sabya, is post-Palaeolithic. Two OSL samples were taken from the alluvium where it was exposed in a small quarry (WP504) in order to date this major landscape unit.

Abu Arish Lava Flows and Wadi Jizan Lake

Wadi Jizan Dam Lake

Palaeolithic artefacts were observed on a lava flow at the western edge of the lake behind Wadi Jizan Dam (WP415–417). The artefacts, flakes and cores on quartzite, basalt and chert appear to be MSA and later (Figure 4). The site itself is on a vantage point above the dam lake, where, prior to the construction of the dam, at least four main wadis flowed together into Wadi Jizan, affording commanding views over an area potentially attractive for animals.



*Figure 4. MSA basalt flakes from WP415–417, overlooking the Wadi Jizan Dam lake.
Photo: Robyn Inglis*

The area of lava flows that extend below the dam, East of Abu Arish, was investigated at a number of locations:

- WP421–42: no artefacts were recovered from what appears to be quite a porous, low quality basalt flow.
- WP423–429: an ESA basalt core and MSA basalt and chert flakes were observed, on a younger, less-porous flow of lava above WP421–422.
- WP574–578: on the edge of the same, younger lava flow as WP423–429, cut by a wadi, a single broken andesite pebble was observed, possibly transported from the wadi bed by humans.
- WP572–573: in an area of lava away from any marked watercourses, basalt (ESA) flakes and quartz flakes (potentially later than MSA) were observed.

- WP561–570: basalt ESA and MSA flakes were observed on a lava terrace above Wadi Jizan. Samples of lava were also taken for dating from this location.
- WP540–546: ESA and MSA artefacts on basalt, chert and andesite were observed on the lower part of a lava flow adjacent to a wadi.

In a quarry to the south of the main Abu Arish-Fayfa road, quarrying has exposed deep sequences of wadi sands and silts preserved below in situ lava flows (WP408–412, WP579–585). Samples of this lava were taken for dating. On the surface of the lava, a range of lithics was observed, including MSA quartz and chert flakes as well as ESA basalt flakes. This area, like that of the sediments preserved under tuff near Wadi Sabya, contains high potential for the preservation of stratified material.

Jebel Umm Al Qumam

The two cinder cones of Jebel Umm Al Qumam, SE of Abu Arish and close to the modern town of Al Wahmah were revisited after a brief reconnaissance in May 2012. An extensive array of lithics was recovered from the lava flow that extends to the SW of the northernmost cinder cone (WP413A–414 and WP430–460). Over 50 lithic artefacts including flakes and cores were collected and logged from this area, predominantly ESA and MSA material on basalt, with some on chert (Figure 5) and quartzite, as well as a potential LSA retouched chert flake. The area appears to have been consistently a major focus of activity throughout the Palaeolithic, and should be investigated more fully in future seasons.



The lava flow is covered by later sediments in the form of orange-red alluvium, and, overlying this there are more recent dunes that are undergoing erosion by small wadis. These two landscape units, post-dating the lava, may potentially contain stratified archaeological material. In order to date the succession of these units to focus future investigations, further, OSL samples were removed from the alluvium in one location (WP892), and from the aeolian material in two other locations (WP893 and WP898).

Figure 5. Lithics from the lava flows on the SE edge of Jebel Umm Al Qumam. Photo: Andrew Shuttleworth

Northern Jizan, Asir and Southern Qunfudah

Wadi Aramram, Jebel Baqarah and Jebel Lababa

Wadi Aramram, draining from the escarpment, runs through the gap between the sandstone and quartzite Jebel Baqarah and the volcanic Jebel Lababa, both marked topographic features in their landscape, before flowing to the sea (Figure 6).

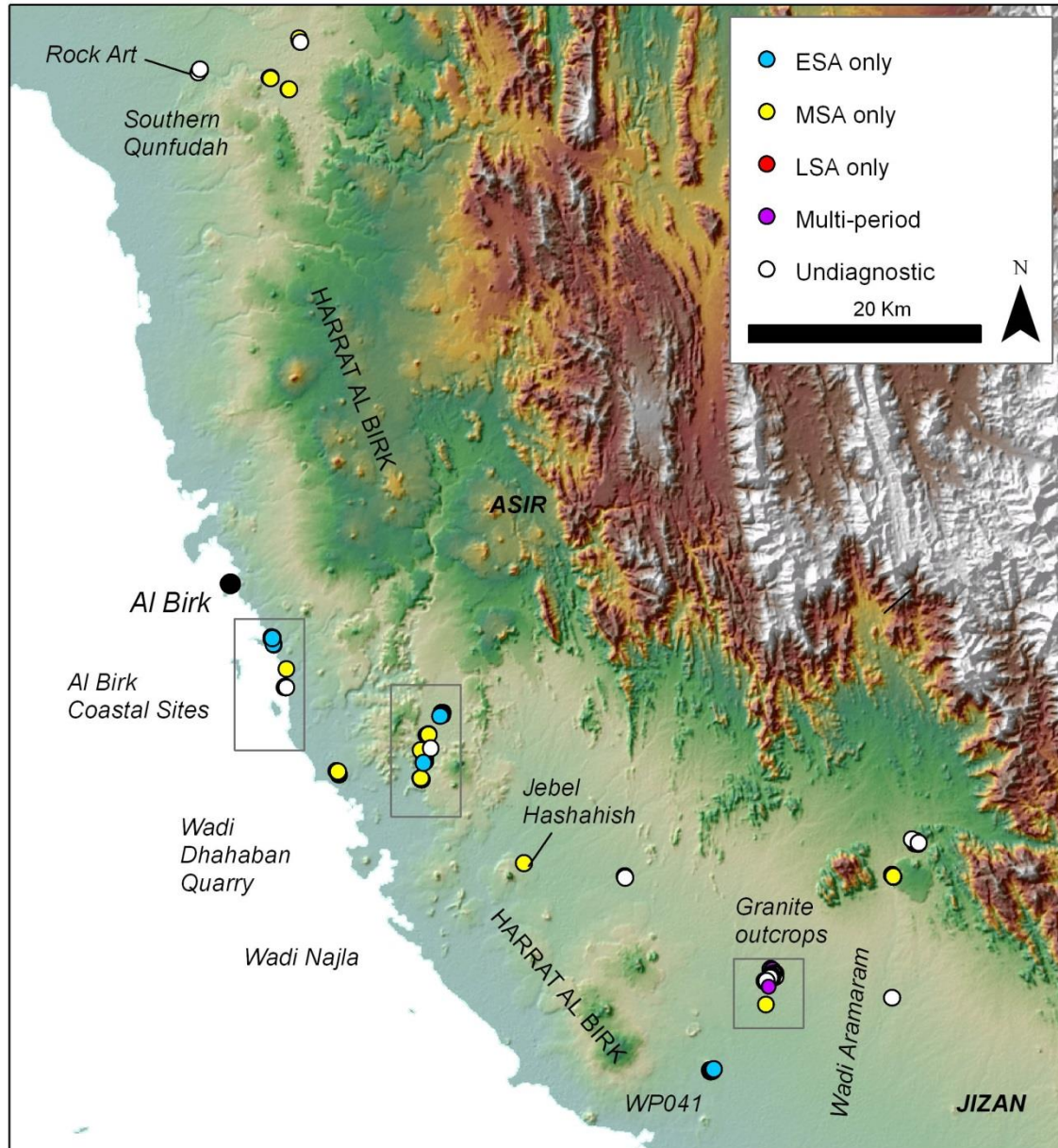


Figure 6. Map of locations visited in Northern Jizan, Asir and Qunfudah regions showing interpreted cultural affinities of Palaeolithic artefacts observed. Elevation data © CGIAR-CSI SRTM 90m v4.1 database. Map prepared by Robyn Inglis.

The wadi was visited at three locations:

- WP865–875, WP885–888: on the flanks of sandstone jebels to the north of Jebel Lababa, MSA sandstone flakes were observed. Behind these jebels, in an area of trapped sediment incised by wadis, a mixture of undiagnostic chert and quartzite lithics was observed in the wadi bed.
- WP876–886: basalt ESA and MSA artefacts were found on the lava flow at the eastern edge of Jebel Lababa.
- WP861–863: no artefacts were observed at this location, an area of exposed schist and quartzite that forms a topographic high in the landscape

Jebel Hashahish

The rockshelters in the lava flow at the base of Jebel Hashahish located in November 2012 were investigated further (WP857–858). Above the rockshelters, a mixture of MSA and potentially later flakes and cores on quartz, basalt, indurated shale and chert were observed.

Granite Outcrops

A series of granite outcrops to the east of the Shugaig-Muhayil road were visited (WP607–622, WP804–850), and yielded a large number of artefacts. A transect of 1km was walked between two of these outcrops (Figure 7). Artefacts include MSA and ESA material, as well as potentially later material on a range of raw materials, such as basalt, quartz, chert and sandstone.



Figure 7. View from granite outcrops looking NE across area of transect where ESA, MSA and LSA artefacts were recorded. Photo: Robyn Inglis.

Western Edge of Harrat Al Birk

The volcanic jebel identified as WP041 in November was re-visited, and a large range of additional lithics was logged and recovered (WP594–606) to add to those already recorded. The material was almost exclusively ESA and MSA and on basalt, although one chert endscraper was also observed which may be later in date. This further underlines the site as an important locale for human populations throughout prehistory.

Wadi Najla

Bounded by old lava flows that overlie schist and sandstone bedrock, Wadi Najlan runs from a large, flat basin c.10km inland to the sea through a deep gorge incised through more recent lava flow deposits that have left spectacular cliffs of columnar basalt. In this gorge, major deposits of tufa were observed (Figure 8), marking periods of a wetter environment, as well as deposits that could have dammed the wadi flow. This lava flow ceases ~6km from the sea after which the valley broadens once more to reflect its ancient topography.



Figure 8. Tufa deposits in Wadi Najla gorge. Photo: Robyn Inglis.

Artefacts were observed at a number of locations along Wadi Najla.

- WP676–693: on the flanks of an isolated jebel in the basin at the head of the wadi, many MSA and some potentially ESA lithics were observed, as well as deposits of heavily weathered tufa, which were sampled for further analysis.

- WP695–706: at the head of the gorge incised through the lava, numerous ESA basalt lithics were observed on the lava surface. Within the gorge, samples of lava and tufa were taken for dating and further analysis.
- WP765–769, WP801–802: only one potential MSA quartz flake was recovered from the lava flow overlooking the deep gorge at this point, but the extensive tufa deposits in the wadi bed were sampled for palaeoenvironmental analysis and dating (Figure 8).
- WP770–783 and WP803: potential MSA and some ESA lithics on basalt and andesite were observed on an alluvial terrace in the base of the gorge. Above this, on the lava flow overlooking the wadi, ESA and MSA basalt flakes were observed. A tufa deposit from the base of the wadi was sampled for palaeoenvironmental and dating analysis, along with lava from the top of the lava flow.

In addition to investigations in the main wadi, the headwaters of a small tributary draining the lava flows were visited (WP785–800). Here, alongside tufa deposits (sampled for palaeoenvironmental analysis and dating), ESA and MSA basalt artefacts were observed.

Wadi Dhahaban

At the mouth of Wadi Dhahaban, on its southern edge, an apparently disused quarry was investigated (WP292) as a result of observations in May–June 2012 of a deep marine sequence preserved in the wadi cut, underlying surface scatters of lithics (Figure 9).



Figure 9. Beach sediments with embedded lithics exposed by wadi erosion in Wadi Dhahaban Quarry. Figures on the left are standing at the top of the exposure that contains the embedded lithics. Photo: Robyn Inglis

Closer inspection of the quarry, where thick deposits of beachrock overlying lava flows are exposed, revealed ESA and MSA artefacts both on the present surface of the beach deposits and also on the surrounding lava flows. In addition, a number of flakes embedded within these beach deposits were exposed where the deposits are cut by a small wadi (Figure 9).

The exact relationship of the deposition of the beach deposits to the lithics is unclear - a number of lithics lie in a clast-rich unit at the base of the sequence, consisting of well-rounded cobbles of lava. The lithics themselves are relatively unweathered indicating that they have not moved far from their environment of deposition (Figure 10). The entire unit is cemented by carbonate deposition, presumably linked to the development of the beach rock deposits that overlie it. Overlying the clast-rich unit are bedded deposits of beach shell sand that also contain embedded lithics.



Figure 10. Flake embedded in clastic unit underlying beach rock, Wadi Dhahaban Quarry. Photo: Andrew Shuttleworth.

The beach sediments were sampled for OSL dating and further analysis where they were exposed in the main quarry area, as well as in the area containing the embedded lithics. Further detailed research at this key site is required in order to fully date and map the beach sediments and to confirm their relationship to the embedded lithics.

Al Birk Coastal Sites

A number of coral terrace outcrops along the modern coastline were visited to investigate in more detail observations of potential lithics made by earlier authors as well as by the DISPERSE team in May–June 2013.

Coral terraces were visited at four locations south of Al Birk:

- WP287–288, WP627–40 and WP669–670: ESA basalt flakes and cores were observed on the lava flows above the raised coral terrace, upon which lay MSA basalt flakes.
- WP289, WP641–649: MSA and ESA artefacts on basalt were observed on the upper, disturbed parts of coral terraces overlying lava flows.
- WP650–653: an MSA flake was observed on the lava flow above an area of coral terrace.
- WP654–668, WP672–674: at CASP site 216–208 (Zarins et al. 1981) extensive scatters of ESA and MSA basalt artefacts were observed on coral terraces on two sides of a volcanic jebel, including a crude handaxe, radial cores and flakes.

Southern Qunfudah

A preliminary reconnaissance visit was undertaken to the northern edge of the Harrat Al Birk, Southern Qunfudah province. Whilst the visit was brief, MSA artefacts were identified at three locations: two on lava flows adjacent to the present wadi that cuts deep gorges through them (WP715–726, WP744, and WP732–735, WP745–746), as well as on the slopes of a basalt and quartzite jebel (WP727–730). Undiagnostic Palaeolithic

artefacts were observed on the surface of an area of lava adjacent to the wadi (WP737–741).



Rock art was observed in a small valley adjacent to the main wadi at WP217–219 (Figure 11). The art, engraved on columnar basalt lava flows, is concentrated in two areas, with the first covering around 5m². The second, larger concentration continues for about 8m along the edge of the flow. This site requires more detailed recording and typological analysis, and also points to the need for further investigation to look for more rock art in the immediately surrounding area.

Figure 11. Engraved panel on basalt flow (WP715). Photo: Robyn Inglis.

Given the deep Quaternary sedimentation in the area, there is high potential for the survival of stratified sites, with deep wadi cuts allowing potential access to these sediments. The observation of tufa deposits adjacent to the main wadi (WP742) also highlights the potential for environmental and hydrological reconstruction in the area, and a sample of this tufa was taken for further analysis.

Conclusion

The results of this field season highlight the significant potential of the Jizan area for furthering our understanding of the Palaeolithic of the Arabian Peninsula. In addition to extensive archaeological remains in the area, which span the ESA, MSA and LSA, there are multiple areas and landscape features such as tufa outcrops and coral terraces that hold the potential to contribute significantly to our understanding of Quaternary palaeoenvironments in Southern Arabia.

Acknowledgements

We thank HRH Prince Sultan bin Salman bin Abdul Aziz, President of the Saudi Commission for Tourism and Antiquities (SCTA), KSA, Professor Ali Al-Ghabban, Vice-President, and Jamal Al Omar, Director General for granting fieldwork permission and for their interest in and support of our work in Saudi Arabia. Grateful thanks are also extended to the staff of the SCTA offices in Jizan and Sabya. The work is funded by the European Research Council (ERC) under the Ideas Programme of the 7th Framework Programme as Advanced Grant 269586 'DISPERSE: Dynamic Landscapes, Coastal Environments and Human Dispersals'.

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Appendix 1. Fieldwork Team

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